

Compound	Name	Structure
P1	3,3-Diphenyl-1-{4-[phenyl-(4-trifluoromethyl-phenyl)-methyl]-piperazin-1-yl}-propan-1-one	
P2	3,3-Diphenyl-1-{4-[phenyl-(3-trifluoromethyl-phenyl)-methyl]-piperazin-1-yl}-propan-1-one	
P3	1-{4-[(4-Methoxy-phenyl)-(4-trifluoromethyl-phenyl)-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P4	1-{4-[(3,5-Di-tert-butyl-4-hydroxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P5	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid ethyl ester	
P6	1-{4-[(4-Chloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	

Figure 1

Com- pound	Name	Structure
P7	1-[4-(Benzo[1,3]dioxol-5-yl-phenyl-methyl)-piperazin-1-yl]-3,3-diphenyl-propan-1-one	
P8	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid	
P9	1-{4-[(3,5-Dichloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P10	1-{4-[(3,5-Bis-trifluoromethyl-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P11	1-{4-[(4-tert-Butyl-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P12	1-{4-[(2-Difluoromethoxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	

Figure 1

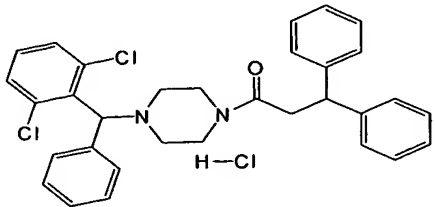
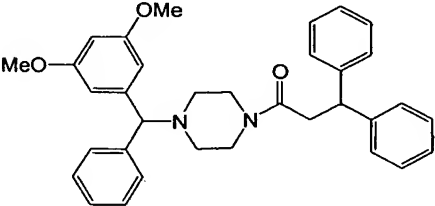
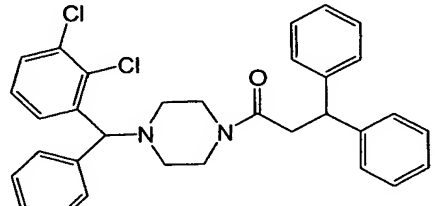
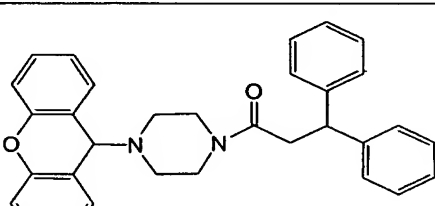
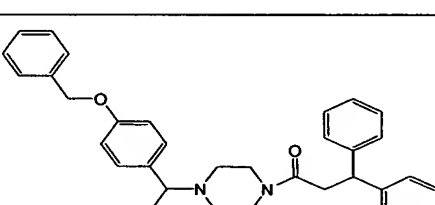
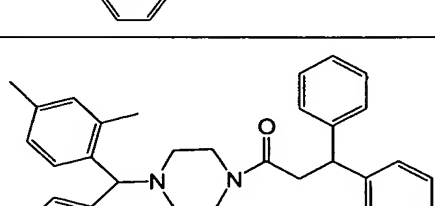
Com- pound	Name	Structure
P13	1-{4-[(2,6-Dichloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P14	1-{4-[(3,5-Dimethoxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P15	1-{4-[(2,3-Dichloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P16	3,3-Diphenyl-1-[4-(9H-xanthen-9-yl)-piperazin-1-yl]-propan-1-one	
P17	1-{4-[(4-Benzoyloxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P18	1-{4-[(2,4-Dimethyl-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	

Figure 1

Compound	Name	Structure
P19	1-{4-[Bis-(4-methoxy-phenyl)-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P20	1-{4-[(4-Methoxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P21	1-{4-[(4-Hydroxy-3,5-dimethoxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P22	3,3-Diphenyl-1-{4-[phenyl-(2-trifluoromethyl-phenyl)-methyl]-piperazin-1-yl}-propan-1-one	
P23	3,3-Diphenyl-1-[4-(phenyl-p-tolyl-methyl)-piperazin-1-yl]-propan-1-one	
P24	1-{4-[(4-Fluoro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	

Figure 1

Compound	Name	Structure
P25	3,3-Diphenyl-1-{4-[phenyl-(3,4,5-trimethoxy-phenyl)-methyl]-piperazin-1-yl}-propan-1-one	
P26	1-{4-[Benzo[1,3]dioxol-5-yl-(4-methoxy-phenyl)-methyl]-piperazin-1-yl}-3,3-diphenylpropan-1-one	
P27	1-[4-(10,10-Dioxo-9,10-dihydro-10lambda*6*-thioxanthen-9-yl)-piperazin-1-yl]-3,3-diphenylpropan-1-one	
P28	3,3-Diphenyl-1-[4-(9H-thioxanthen-9-yl)-piperazin-1-yl]-propan-1-one	
P29	1-{4-[(2,4-Dichloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenylpropan-1-one	
P30	1-{4-[(3,4-Dichloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenylpropan-1-one	

Figure 1

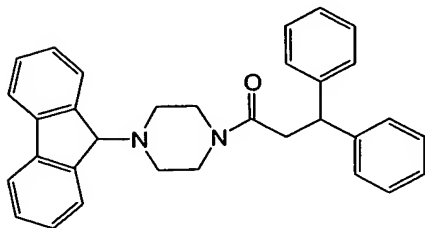
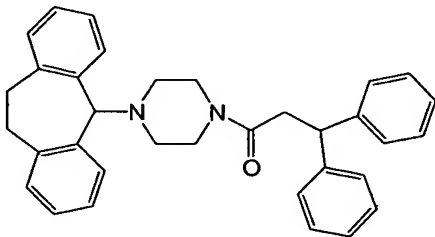
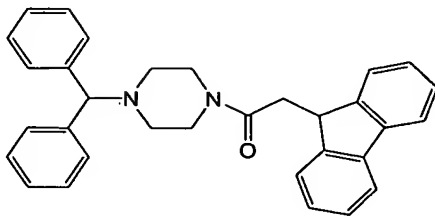
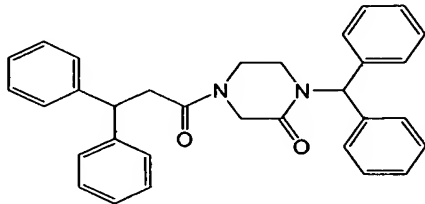
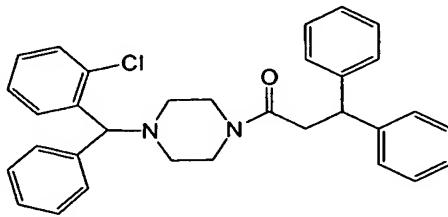
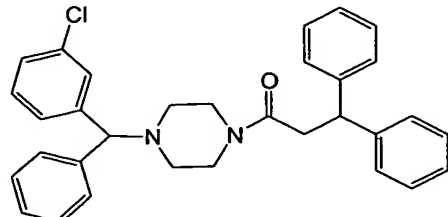
Compound	Name	Structure
P31	1-[4-(9H-Fluoren-9-yl)-piperazin-1-yl]-3,3-diphenyl-propan-1-one	
P32	1-[4-(10,11-Dihydro-5H-dibenzo[a,d]cyclohepten-5-yl)-piperazin-1-yl]-3,3-diphenyl-propan-1-one	
P33	1-(4-Benzhydryl-piperazin-1-yl)-2-(9H-fluoren-9-yl)-ethanone	
P34	1-Benzhydryl-4-(3,3-diphenyl-propionyl)-piperazin-2-one	
P35	1-{4-[(2-Chloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P36	1-{4-[(3-Chloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	

Figure 1

Compound	Name	Structure
P37	1-(4-Benzhydryl-2-methyl-piperazin-1-yl)-3,3-diphenyl-propan-1-one	
P38	4-Benzhydryl-1-(2-9H-fluoren-9-yl-acetyl)-piperazine-2-carboxylic acid	
P39	4-Benzhydryl-1-(2-9H-fluoren-9-yl-acetyl)-piperazine-2-carboxylic acid ethyl ester	
P40	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid	
P41	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid ethyl ester	
P42	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid	
P43	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid ethyl ester	

Figure 1

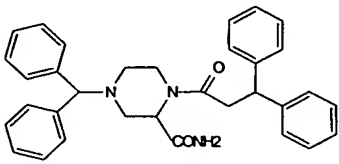
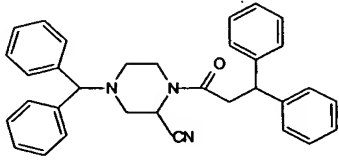
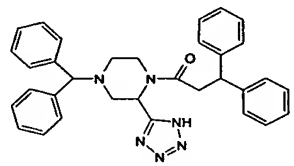
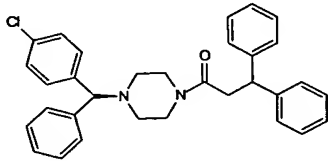
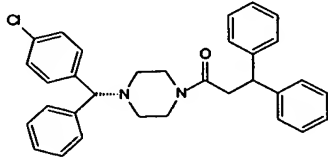
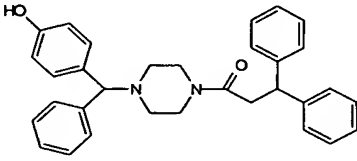
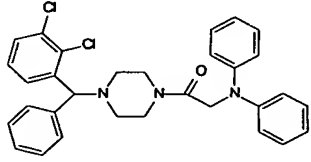
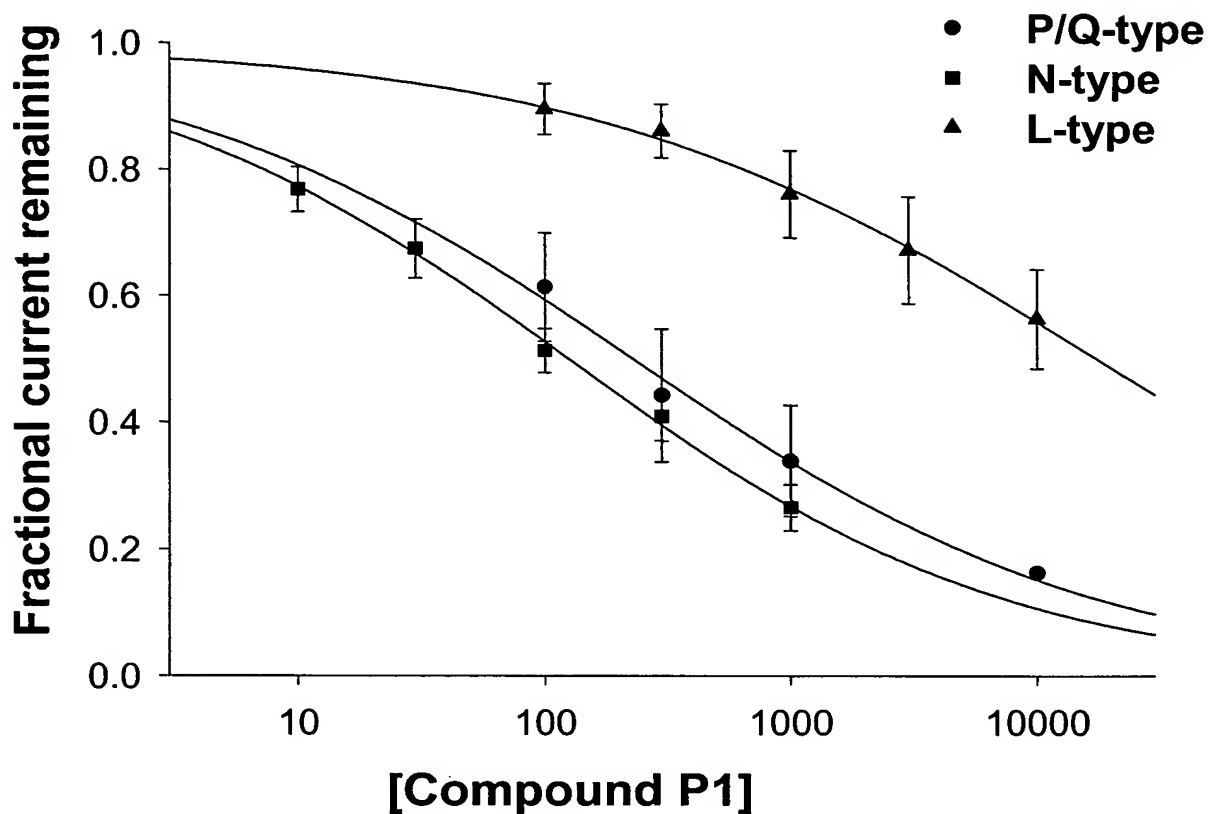
Compound	Name	Structure
P44	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carboxylic acid amide	
P45	4-Benzhydryl-1-(3,3-diphenyl-propionyl)-piperazine-2-carbonitrile	
P46	1-[4-Benzhydryl-2-(1H-tetrazol-5-yl)-piperazin-1-yl]-3,3-diphenyl-propan-1-one	
P47	1-{4-[(4-Chloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P48	1-{4-[(4-Chloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P49	1-{4-[(4-Hydroxy-phenyl)-phenyl-methyl]-piperazin-1-yl}-3,3-diphenyl-propan-1-one	
P50	1-{4-[(2,3-Dichloro-phenyl)-phenyl-methyl]-piperazin-1-yl}-2-diphenylamino-ethanone	

Figure 1

Selectivity of Compound P1 for N-type Ca^{2+} Channels



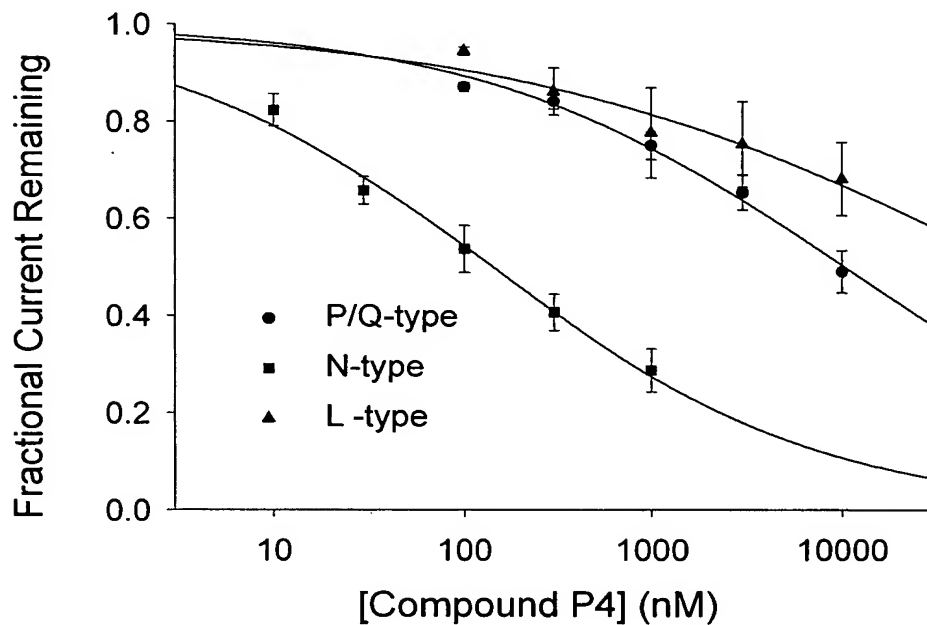
P/Q-type $\text{IC}_{50} = 966 \pm 461 \text{ nM}$ ($n=7$)

N-type $\text{IC}_{50} = 190 \pm 70 \text{ nM}$ ($n=10$)

L-type $\text{IC}_{50} \gg 10 \text{ }\mu\text{M}$ (estimated: $19.6 \pm 9.2 \text{ }\mu\text{M}$) ($n=5$)

Figure 2

Effect of Compound P4 on Various Ca^{2+} Channels



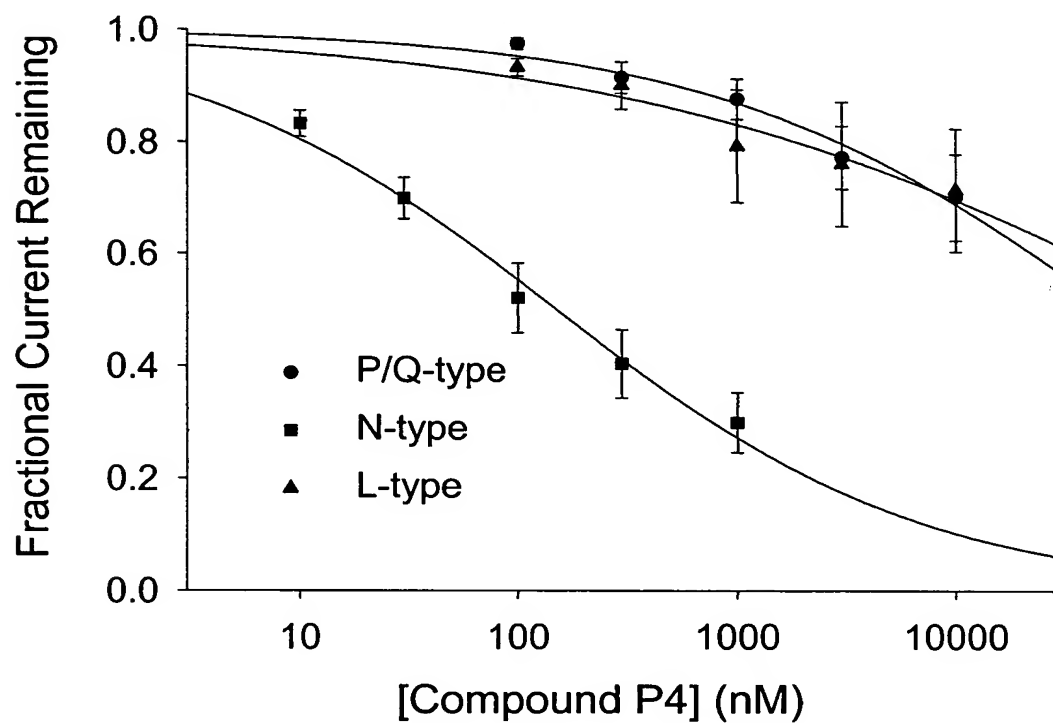
IC_{50} P/Q-type = 7592 ± 1076 nM (n=4)

IC_{50} N-type = 185 ± 68 nM (n=5)

IC_{50} L-type $\gg 10$ μM (n=5)

Figure 3

Effect of Compound P4 on Various Ca^{2+} Channels



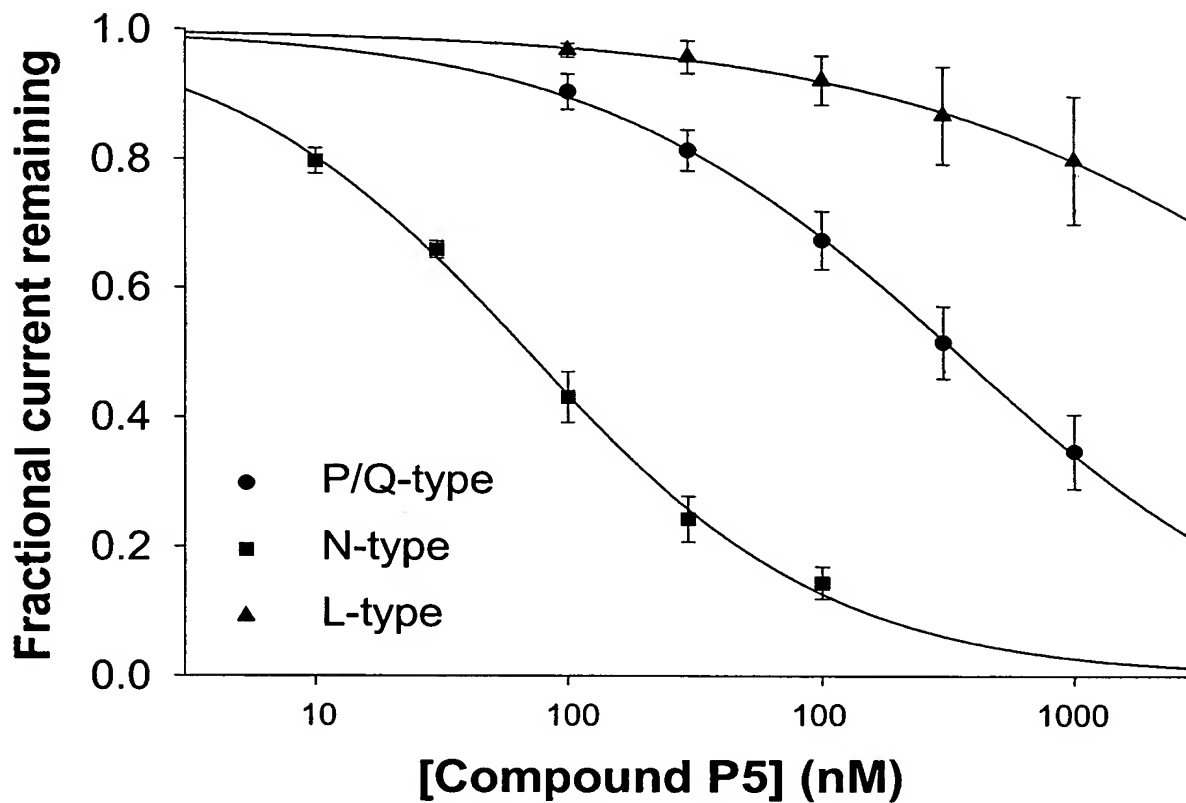
IC_{50} P/Q-type $\gg 10 \mu\text{M}$ (n=5)

IC_{50} N-type = $251 \pm 103 \text{ nM}$ (n=6)

IC_{50} L-type $\gg 10 \mu\text{M}$ (n=5)

Figure 4

Selectivity of Compound P5 for N-type Ca^{2+} Channels



P/Q-type $\text{IC}_{50} = 5.028 \pm 1.979 \mu\text{M}$ (n=6)

N-type $\text{IC}_{50} = 0.073 \pm 0.01 \mu\text{M}$ (n=5)

L-type $\text{IC}_{50} = 210 \pm 130 \mu\text{M}$ (n=6)

Figure 5

Selectivity of Compound P6 for N-type Ca^{2+} Channels

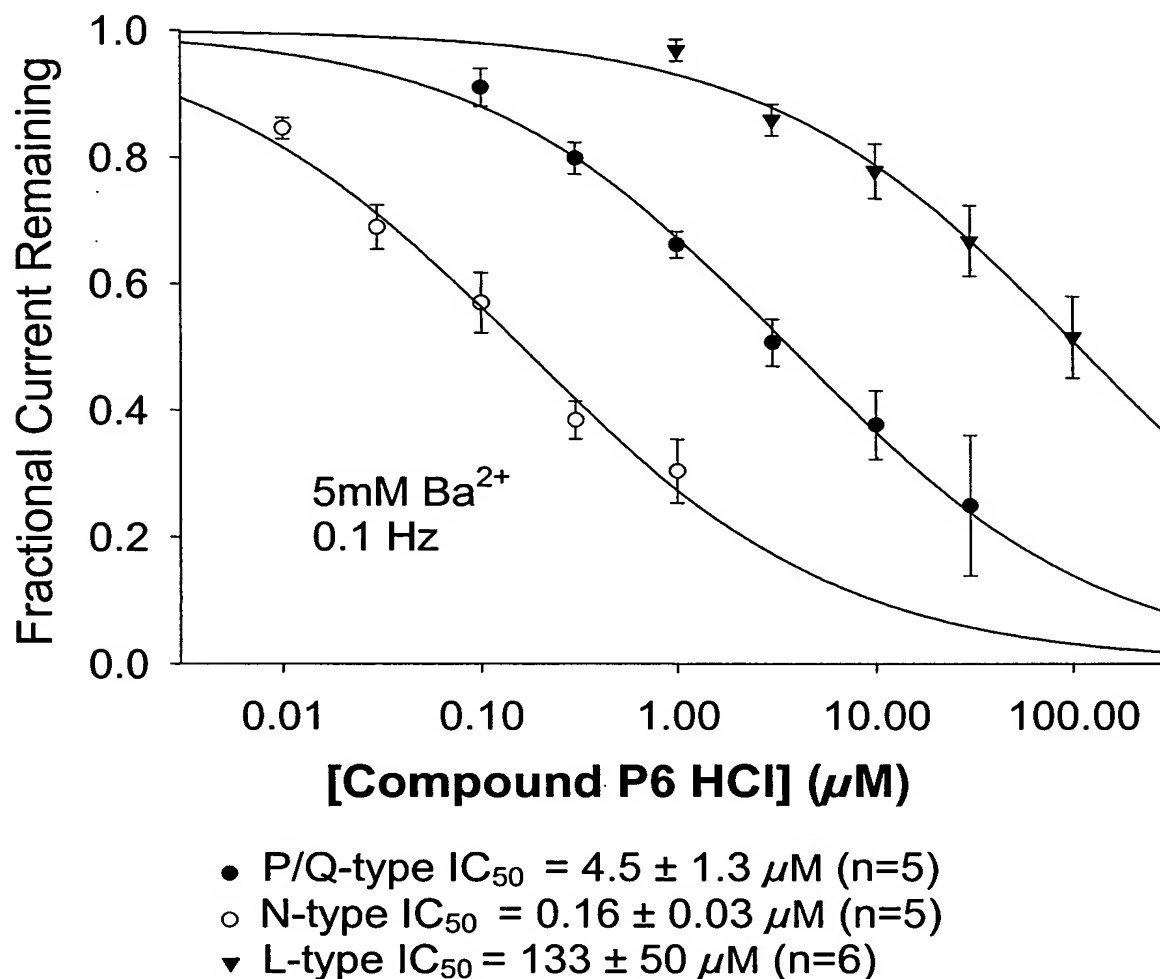
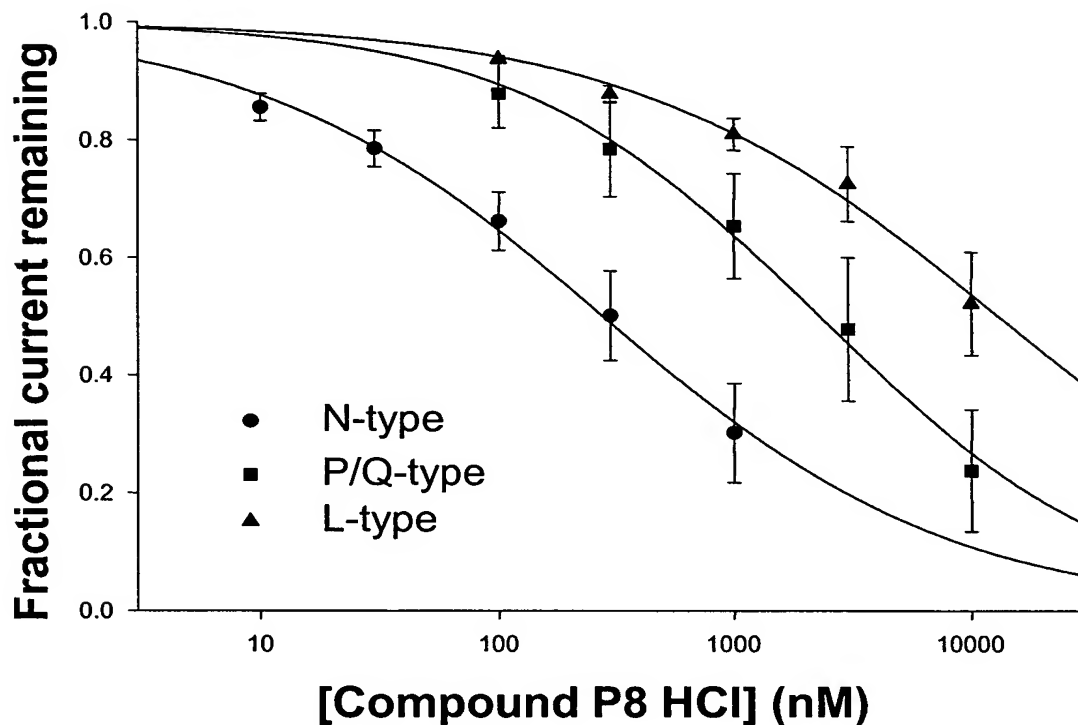


Figure 6

Selectivity of Compound P8 for N-type Ca^{2+} Channels



P/Q-type $\text{IC}_{50} = 3.383 \pm 1.455 \mu\text{M}$ (n=5)
N-type $\text{IC}_{50} = 0.359 \pm 0.135 \mu\text{M}$ (n=5)
L-type $\text{IC}_{50} = 37.140 \pm 20.930 \mu\text{M}$ (n=5)

Figure 7